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The Future of Process Safety

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Abstract

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Process safety has been practiced for several decades, but it is only in recent years that it has become an established discipline. During this evolution we have seen the development of risk assessment techniques and inherently safer design. In more recent time we have seen a focus on human factors and work on the cultural impacts. So what does the future hold? This paper will explore what the current challenges to process safety are today and look at possible strategies to overcome them. The challenges have been identified from a series of global consultations which was done in collaboration with Mark Kay O'Connor Process Safety Center. The strategies were identified with the assistance of a global committee of process safety leaders from industry, academia and regulators.

Introduction

Process safety has been actively practiced as a profession for over 50 years. In this time we have seen it expand and grow through valuable research both in academic institutions and innovation in industry. But process safety is now reaching a cross roads. Process safety catastrophes continue to happen around the world each year, so are we any safer? How have we failed to make a greater impact on the occurrence of process safety incidents? To answer these questions we need to understand what our challenges are and then how we can potentially overcome them. Science and engineering are needed to address the grand challenges of the world today, such as energy, food and nutrition, health and wellbeing and water. But the science must be sustainable, and this means we need to improve process safety outcomes, lest the field becomes irrelevant.

The challenges

Challenges to improving process safety need to be considered from four different perspectives. These cover all the areas that can shape process safety outcomes and are impacted by these outcomes. These perspectives are; academia, industry, regulatory and societal.

In an effort to indentify challenges in these areas, a series of consultation sessions were held across a number of geographies. These included North America, Australia, New Zealand and Asia, the Middle East and the United Kingdom with some European input. It should be noted that during the consultation sessions responses were not mandatory, so any results are representative of the variety of attendees and may not reflect actual numbers in the regions.

In each consultation the following four questions were asked;

- What are the key industry challenges in process safety?
- What are the key academic challenges in process safety?
- What are the key regulatory challenges in process safety?
- What are the key societal challenges in process safety?

The two five challenges in each question were collated to show the key areas for opportunities to improve in the future. The results were as follows:

- What are the key industry challenges in process safety?
    1. Money
    2. Culture
    3. Leadership
    4. Competency
    5. Understanding
- What are the key academic challenges in process safety?
    1. Collaboration
    2. Money
    3. Experience
    4. Practical
    5. Content
- What are the key regulatory challenges in process safety?
    1. Competency
    2. Regulations
    3. Politics
    4. Complexity
    5. Compliance
- What are the key societal challenges in process safety?
    1. Understanding
    2. Trust
    3. Risk
    4. Communication
    5. Competency

From these some common themes emerged across all of the areas, namely competency, being able to make a valid business case for process safety and collaboration.

Opportunities for the future

So if these are the challenges, what are the opportunities?

There are a number of opportunities in the academic space. These include process safety focused curricula development and expanding it beyond just chemical engineering. Finding new and different ways to teach process safety and operational aspects, such as during laboratory activities. Embedding research and encouraging work experience for students as well as developing practical experience of the academics and offering more education for industry and regulators.

In the Regulatory space, there is a need to develop clear and consistent legislation that is based on science and risk assessment and build overall competency of the regulators, enabling them to play a more proactive role in achieving good process safety outcomes.

Industry has a significant part to plan in embracing the opportunities for the future. A paradigm shift is required from a lowest cost philosophy to an improving value philosophy. This includes recognising personnel as valuable contributors who need to maintain competency for optimal organisation capability. Industry also has a role to assist both academia and regulators to develop their competency, as well as putting a priority on research for future development.

From a societal perspective, all areas need to improve transparency to enhance engagement. This includes supporting the community to be part of risk based discussion.

Your chance to get involved

Process Safety for the 21st Century and Beyond provides more detail on possible actions and a opportunities for involvement and was initially published by the IChemE Safety Centre and the Mary Kay O'Connor Process Safety Center in October 2017 and is available for download from these organisations websites. But the journey does not end there. We all have a role to play in shaping the future of process safety, no matter where we are. Feedback on the initial work is welcomed as we continue to frame options and solutions. Feedback can be sent to safetycentre@icheme.org

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